Chmutov, K. V.

AUTHORS: Bubyreva, N.S., Markin, B.I., Bindas, B.P., Silkin, Yu.A., Chmutov, K.V. 76-11-31/35

TITLE: A Combined Device for the Joint Measuring of Viscosity, Density and Solidification-Melting Temperature (Kombinirovannyy pribor dlya izmereniya vyazkosti, plotnosti i temperatury zatverdevaniya-plavleniya)

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1957, Vol. 31, Nr 11, pp. 2580-2583 (USSR)

ABSTRACT: A combined measuring device for the remote determination of some physical-chemical liquid constants, viz. density, viscosity, and solidification-melting temperature is described. The principal part of this device is a vessel into which a certain quantity (about 5 ml) of the liquid to be investigated is introduced by way of a siphon. For the purpose of measuring viscosity the device was first thermostatized at a given temperature for 30-60 minutes. Hereupon underpressure was produced in the pipette, the liquid rose up to the level of the electrodes, the system was connected with the outer air, and the liquid was able to emerge freely from the capillary. A comparison with liquids of known viscosity resulted in a maximum error of 2%. Errors committed when measuring density amounted to a maximum

Card 1/2

A Combined Device for the Joint Measuring of Viscosity, Density and Solidification-Melting Temperature

of 0.3% and the error committed when determining solidification melting temperature did not exceed 0.5° C. The latter was determined by means of thermograms on Kurnakov's pyrometer. There are 2 figures, 4 tables and 2 Slavic references.

SUBMITTED: April 17, 1957

AVAILABLE: Library of Congress

Card 2/2

CHMUTOV, K.V.

Hydrodynamical model of an atomic explosion. Priroda 46 no.1:115-116 Ja '57. (MLRA 10:2)

1.Chlen-korrespondent Akademii nauk SSSR. Institut fizicheskoy khimii Akademii nauk SSSR, Moskva.
(Atomic bomb--Testing)

CHMUTOV, K.V.

Interesting variant of a classical experiment. Priroda 46 no.9: insert S '57. (MLRA 10:8)

1. Chlen-korrespondent Akademii nauk SSSR, Moskva.
(Radiography)

CHMUTOV, K. V., and FILATOVA, N. V.

"A Hydrodynamic Model of Sorption Columns,"

paper presented at the Second Gas Chromatography Symposium, Amsterdam, 19-23 May 1958.

(Acad. Sci. USSR)

CHMUTOV K.V.

BUROV, Andrey Konstantinovich,; ANDREYEVSKAYA, Galya Dmitriyevna,; CHMUTOV, K.V., otv. red.; BOYARSKIY, V.A., red. izd-va,; KASHINA, P.V.,tekhn. red.

[High-strength glass reinforced plastics (SVAM)] Vysokoprochnye stekloplastiki (SVAM). Moskva, Izd-vo Akad. nauk SSSR, 1958. 70 p. (MIRA 11:11)

1.Chlen-korrespondent AN SSSR (for Chmutov).
(Glass reinforced plastics)

ALEKSANDROV, Anatoliy Vasil'yevich; CHMUTOV, K.V., red.; SHOKIN, S.A., red.; MURASHOVA, N.Ya., tekhn.red.

[Indicators of invisible particles and radiations] Schetchiki nevidimykh chastits i izluchenii. Pod red. K.V. Chmutova. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1958. 92 p. (MIRA 12:2)

1. Chlen-korrespondent Akademii nauk SSSR (for Chmutov).
(Nuclear counters) (Ionization chambers)

75-13-2-2/27

AUTHORS: Ol'shanova, K. M., Chmutov, K. V.

TITLE: Chromatographic Method in Qualitative Analysis (Khromatograficheskiy metod v kachestvennom analize) IV. The Analysis of Cations of the Third Analytical Group (IV. Analiz kationov tret'yey analiticheskoy gruppy)

PERIODICAL: Zhurnal Analiticheskoy Khimii, 1958, Vol. 13, Nr 2, pp. 162-171 (USSR)

ABSTRACT: In a previous paper (Ref 1) report was given on the arrangement of cations and anions of each single group in the adsorption series according to the degree of their adsorption on some adsorbents. Furthermore, methods were worked out for the qualitative chromatographic analysis of cations of the fourth and fifth analytical group on aluminum oxide as adsorbent (Refs 2, 3). In the present paper the qualitative chromatographic analysis of cations of the third analytical group on aluminum oxide as adsorbent is worked out. The cations Fe^{3+}, Co^{2+}, Ni^{2+} and Cr^{3+} can be proved immediately on the adsorbent: aluminum oxide and permutite. On sulfonite only Fe^{3+} can be proved, whereas the other cations form dim zones

Card 1/3

Chromatographic Method in Qualitative Analysis. IV. The Analysis of Cations of the Third Analytical Group

with respect to coloration. Al^{3+}, Fe^{2+}, Mn^{2+} and Zn^{2+} cannot be proved without development on the adsorbents. Nickel can be proved on aluminum oxide only in the case of absence of Co^{2+}-ions in the solution, since this is adsorbed in the same zone as Ni^{2+}. The same applies in the case of Fe^{3+} and Cr^{3+}. The detection limit for the proof on aluminum oxide without development lies for Fe^{3+} at 5,4 γ, for Co^{2+} at 35,0 γ, for Ni^{2+} at 35,0 γ and for Cr^{3+} at 30,0 γ.
The authors showed that the cations of the third analytical group can be proved chromatographically on aluminum oxide, permutite, and sulfonite as adsorbents by means of various generators and precipitants. Solutions of ammonium thiocyanate, lye, dithionic acid, potassium chromate, nitric ammonium--tetrathiocyanate-mercuroate $(NH_4)_2[Hg(SCN)_4]$ and ammonia served here as developer. The solutions of caustic soda and potassium chromate were used as precipitants. In a comparison between the precipitation chromatographs and the ionite--chromatographs it was found that there is almost no difference in the coloration of the zones, the precipitation chromatographs have, however, better marked boundaries of the colored zones. Also a qualitative chromatographic method was

Chromatographic Method in Qualitative Analysis. IV. The Analysis of Cations of the Third Analytical Group

75-13-2-2/27

worked out for the analysis of the cations of the third analytical group on aluminum oxide as adsorbent by means of which these cations can be proved within 8-10 minutes. The detection limit for the proof of each single cation of the third group on aluminum oxide is given. Furthermore a comparing characteristic of the qualitative methods for the proof of the cations of the third group are given in solution in the paper. The chromatographic method permits the determination of all cations within a shorter time. Only a small quantity of reagents and a very small volume of sample solution is necessary for this purpose; furthermore, this method is more sensitive than other methods. The experimental carrying out of the analysis is described precisely. There are 10 tables and 6 references, 5 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR, Moskva
(Moscow Institute for Physical Chemistry, AS USSR)

SUBMITTED: December 25, 1955

Card 3/3

1. Ions--Chromatographic analysis 2. Aluminum oxides--Adsorption

76-32-5-45/47

AUTHOR: Chmutov, K. V.

TITLE: Chronicle (Khronika) The Decision of the All-Union Conference on Chromatography (Resheniye vsesoyuznogo soveshchaniya po khromatografii) Moscow, February 3-6, 1958(Moskva 3-6 fevralya 1958 g.)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol. 32, Nr 5, pp.1184-1185 (USSR)

ABSTRACT: At this conference at the OKhN AS USSR 56 lectures were held with 507 members taking part from 216 organizations of 39 towns. The various necessities of the further development of chromatography are mentioned in a five point program and the results achieved hitherto in this field are given. Based on these statements the conference recommended a 14 point program. Among other it is demanded that the investigations in the field of the theory of chromatography had to be carried on, as well as the theory and practice of the use of organic reagents and their introduction to industry. The production of apparatus and plants for the ion exchange and distribution chromatography as well as that of a great assortment

of cationites and anionites is recommended, for the latter being recommended a 6 - 7 year plan by the Commission for Chromatography in collaboration with the Ministries for Electric Power Engineering and Chemical Industry. The Gosplan had to be asked to found a department for the production of pure ion exchange materials for scientific investigations, and the scientific technical committee at the Council of Ministers of the USSR had to take corresponding measures for the introduction of developed chromatographic apparatus to industry. The investigations for the formation of new types of ion exchange resins should be widened and the Ministry for Chemical Industry of the USSR has to be asked to organize at the Institute for Chemical Reagents a special production of organic reagents and solvents for chromatography. The Institute for Plastics has to establish GOST standard specifications and check the "TU," ("TU": according to "List of Russian Abbreviations used in the USSR (Munich 1954): Tekhnicheskiye uslovia: Technical specifications). An intensification of the use of ionites as catalysts as well as that of chromatography in biology, biochemistry and medicine

Chronicle. The Decision of the All-Union Conference on Chromatography. Moscow, February 3-6, 1958

76-32-5-45/47

is recommended; in the case of the latter the President of the Academy for Medical Sciences of the USSR had to be asked to found a coordinative commission. The terminology of chromatographical conceptions also had to be rendered uniform and a center within the system of the Academy of Sciences had to be organized as well as the edition of a monograph on chromatographic analyses; the technical information service in this field had to be improved and the OKhN of the AS USSR should be persuaded to found a periodical "Khromatografiya". Special courses are to be arranged, the decision is to be published in "Zhurnal Fizicheskoy Khimii", and a booklet is to be edited; the Commission for Chromatography is to be submitted a concrete plan for the realization of the decisions.

Card 3/3

1. Chromatographic analysis--USSR

AUTHOR: Chmutov, K. V. SOV/76-32-9-46/46

TITLE: Solomon Yul'yevich Yelovich (On His 60th Birthday) (Solomon Yul'yevich Yelovich (K 60-letiyu so dnya rozhdeniya))

PERIODICAL: Zhurnal fizicheskoy, khimii, 1958, Vol 32, Nr 9, pp 2227-2228 (USSR)

ABSTRACT: Solomon Yul'yevich Yelovich, Doctor of Chemical Sciences, attained the age of 60 on July 9, 1958. After finishing his work as an engineer he began his scientific activity in 1932 in the coke-chemical industry in Donbass. His writings include works on the catalytic kinetics of reactions in the liquid state, catalytic hydrogenation of the vegetable fats, general papers dealing with the action of catalysts, isomerization of the triglyceride radicals and their esterification, and the catalytic oxidation of carbon monoxide over manganese dioxide. In recent years S. Yu. Yelovich studied chromatography, together with K. V. Chmutov and L. S. Aleksandrova he developed a method of calculating the diffusion gradients in chromatography, and together with L. G. Kuz'mina he discovered and explained the inversion of the adsorption series in ion-exchange chromatography. S. Yu. Yelovich was a teacher in the Donetskiy

Card 1/2

Solomon Yul'yevich Yelovich (On His 60th Birthday) SOV/76-32-9-46/46

khimicheskiy institut (Donets Chemical Institute), in the Leningradskiy politekhnicheskiy institut (Leningrad Polytechnical Institute), in the Moskovskiy institut khimicheskogo mashinostroyeniya (Moscow Institute for the Construction of Chemical Apparatus), and in other institutions of higher learning. There is 1 figure.

Card 2/2

USCOMM-DC-60,728

5(4)8(1)

AUTHORS: Lapik, V. S., Kalachev, P. M., Silkin, Yu. A., Chmutov, K. V.

SOV/76-32-10-34/39

TITLE: Laboratory Thermostat With Independent Current Supply (Laboratornyy termostat s avtonomnym pitaniyem)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 10, pp 2455-2455 (USSR)

ABSTRACT: Thermostats, connected to a circuit and in working use must be periodically controlled every few days. A thermostat is described which is supplied by an accumulator and which has a special heat insulation. The vessel to be controlled is put into a Deward (D'yuar) container filled with e.g., glycerin. The use of glycerin makes possible operation up to 300°. The heater (6 watt) is in the thermostat liquid (glycerin) and is fed by a 6-volt storage battery. The heater can be in spiral form and made of chromium/nickel. An ordinary relay scheme (Ref 1) serves for its control. The mixing through can be carried out by an air current (from a steel flask with compressed air). The thermostat described needs 2.5 - 3 watt at a temperature control of 75° for a liquid volume of 100ml.

Card 1/2

Laboratory Thermostat With Independent Current Supply SOV/76-32-10-34/39

The volume of the thermostat liquid is given to be 1 l. The accuracy of temperature control amounts to $\pm$ 0.25° and may be increased to $\pm$ 0.1° (by some modifications). There is 1 reference, 1 of which is Soviet.

SUBMITTED: February 27, 1958

Card 2/2

CHMUTOV, K.V., otv.red.; LEVI, T.G., red.izd-va; YEGOROV, N.G., red.izd-va; SHEVCHENKO, G.N., tekhn.red.

[Ion exchange and its applications] Ionnyi obmen i ego primenenie. Moskva, 1959. 318 p. (MIRA 12:9)

1. Akademiya nauk SSSR. Komissiya po khromatografii. 2. Chlen-korrespondent AN SSSR (for Chmutov).
(Ion exchange)

MATORINA, N.N.; SAFONOVA, N.D.; CHMUTOV, K.V.

Frontal analysis in ion-exchange complex-forming chromatography.
Radiokhimiia 1 no.3:346-352 '59. (MIRA 12:10)
(Chromatographic analysis)

MATORINA, N.N.; SAFONOVA, N.D.; [redacted], K.V.

Frontal analysis in ion-exchange complex-forming chromatography. Part 2: Application of frontal analysis in the separation of the micro component from the macro constituent. Radiokhimiia 1 no.3:353-359 '59. (MIRA 12:10)
(Chromatographic analysis) (Acetic acid)

5(0)
AUTHORS: Astakhov, K. V., Dubinin, M. M., Chmutov, K. V., Nekrasov, B. V. SOV/76-33-1-43/45

TITLE: Sergey Aleksandrovich Voznesenskiy (1892-1958) - Obituary (Sergey Aleksandrovich Voznesenskiy (1892-1958))

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 1, pp 234-237 (USSR)

ABSTRACT: S. A. Voznesenskiy doctor of chemical sciences and commercial engineer of the first degree, died on August 6, 1958. As a student, Voznesenskiy worked in the laboratory of Professor N. A. Shilov and was occupied with active carbon fo gas masks for the elaboration of the method by N. D. Zelinski Later on, Shilov sent him to the kafedra fizicheskoy khimii Moskovskogo vysshego tekhnicheskogo uchilishcha (Department o Physical Chemistry of the Moscow School of Technology) for preliminary study for his professorship.
At the same time he worked at the Moskovskaya sanitarnaya stantsiya (Moscow Sanitary Station). In 1919 he became lecturer for chemistry at the Penzenskiy institut Narodnogo obrazovaniya (Penza Institute of National Education) but remained in contact with Shilov's laboratory and, together

Card 1/3

with Shilov, he published papers in Trudy Rossiyskogo nauchno-issledovatel'skogo khimicheskogo instituta (Reports of the Russian Scientific Research Institute of Chemistry) in 1921. In the same year he became lecturer at the Department of Physical Chemistry of the Moscow School of Technology and in 1923 he went to Berlin and worked with Professor **Freundlich.** In 1927 he was sent to Ruhr-Westfalen in order to investigate sewage purification plants and in 1928 he participated in the Bunsen Congress of Chemists. In 1927 Voznesenskiy became lecturer at the kafedra kolloidnoy khimii (Chair of Colloidal Chemistry) and in 1929 professor and chairman of the kafedra analiticheskoy khimii MVTU (Chair of Analytical Chemistry of the MVTU). After the death of I. A. Shilov in 1930, he also became the chairman of the kafedra neorganicheskoy khimii (**Chair** of Inorganic Chemistry). In 1932 the khimicheskiy fakultet MVTU **(Department of Chemistry)** was converted into the Voyennaya akademiya khimicheskoy zashchity (Military Academy of Chemical Defense) and Voznesenskiy kept his post.

Sergey Aleksandrovich Voznesenskiy (1892-1958)- Obituary

SOV/76-33-1-43/45

From 1921 - 1941 Voznesenskiy directed the Laboratory of Water Purification at the Institute "Vodgeo". In 1955 he became professor and head of a chair at the Ural'skiy politekhnicheskiy institut (Urals Polytechnical Institute). He was one of the first to point out the fluoro-organic compounds and wrote a monograph on "The Chemistry of Fluorine". In conclusion, an enumeration of the works by S. A. Voznesenskiy is given, divided into inorganic chemistry, physical and colloidal chemistry and water-technology. There are 1 figure and 65 references, 56 of which are Soviet.

Card 3/3

28 (4)

AUTHORS: Chmutov, K. V., Lapik, V. S., Kalachev, P. M., Silkin, Yu. A. SOV/76-33-7-32/40

TITLE: A Self-compensating Diaphragm Gauge

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 7, pp 1655 - 1656 (USSR)

ABSTRACT: A diaphragm gauge with automatic pressure compensation is described here (Fig). Pressure measurement is carried out by means of a thin membrane. The pressure change is transferred from the membrane to a mercury column, which puts a MN-145A-motor into operation. The latter lifts or lowers (according to the direction in which the membrane moves) a vessel filled with Hg or another liquid, which results in pressure balance. A relay that regulates the performance of the direct-current motor MN-145A is given in a scheme (Fig). It may also be applied to condenser alternating-current motors, e.g. to the type RD-07. For the application of a motor of the type SRD-2, however, the scheme of this relay must be somewhat modified. There is 1 figure.

Card 1/2

A Self-compensating Diaphragm Gauge

SOV/76-33-7-32/40

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii, Moskva (Academy of Sciences of the USSR, Institute of Physical Chemistry, Mosco

SUBMITTED: March 16, 1959

Card 2/2

5(4)

AUTHORS: Aleksandrova, L. S., Yelovich, S. Yu., Chmutov, K. V. SOV/76-33-3-19/41

TITLE: Dynamics of the Sorption of Ions on Various Types of Cation Exchangers.I (Dinamika sorbtsii ionov na kationitakh raznykh tipov. I)

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 3, pp 627 - 635 (USSR)

ABSTRACT: The attempt is made to clarify several rules governing the first stage of the separation process on ionic exchange resins and especially the dynamics of adsorption of ionic mixtures. The effect of temperature and flowing velocity of the solution upon sorption and mutual displacement of the Cu^{2+}- and Co^{2+}-ions is investigated. The cation exchangers MSF, SBS, KM, RF and KU-2 (SDV-3) were used as adsorbers. The investigation of Cl^- and CNS^- anions was carried out on the anion exchangers EMG-1, NO, and EDE-10. Solutions of equinormal mixtures of $Co(NO_3)_2$, and $Cu(NO_3)_2$, pH = 4.0-4.5 were used. Cobalt nitrate solution was marked with Co^{60}. The present paper describes the experimental results obtained in the case

Card 1/3

of dynamics of sorption of the Co- and Cu-ions and KU-2 (in hydrogen form). The two cation exchangers vary greatly with respect to their properties (Ref 1). KU-2 is a sulfonated condensation—product of styrene with divinyl benzoyl with a highly acid HSO_3^- group. RF belongs to the resorcin formaldehyde cation exchangers with a weakly acid $PO(OH)_2$- group. Experimental results obtained in connection with the latter show (Fig 3) that the front of adsorption varies continuously, the cobalt ions migrating in front of the copper ions and the Cu-ions taking the place of the Co-ions. The chromatograms on KU-2 vary greatly from the above-mentioned by the fact that exchange constants of Co and Cu do in this case little differ from one another (Fig 4). The adsorption front of the ions moves parallel and constant in accordance with the rules found by N. A. Shilov. Two experimental series dealing with the dynamics of sorption as a function of the velocity of filtration and the size of grains at three different temperatures led to the finding (Figs 5,6) that the

Dynamics of the Sorption of Ions on Various Types of Cation Exchangers.I SOV/76-33-3-19/41

effect observed on RF, is not due to a diffusion retardation but to the character of the functional group of RF through which under certain conditions adsorption kinetics is brought about, which is not in equilibrium. In the case of KU-2 an increase in temperature leads to an acceleration of the migration of Cu- and Co-ions. There are 6 figures, 1 table, and 5 references, 4 of which are Soviet.

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii, Moskva (Academy of Sciences, USSR, Institute of Physical Chemistry, Moscow)

SUBMITTED: July 24, 1957

Card 3/3

5(4) SOV/76-33-4-29/32

AUTHORS: Finkel', E. E., Chmutov, K. V.

TITLE: The Application of a Flow Counter for the Measurement of the Moisture Permeability of Films From Synthetic Materials With the Aid of Water Marked With Tritium (Primeneniye protochnogo schetchika dlya izmereniya vlagopronitsayemosti plenok iz sinteticheskikh materialov pri pomoshchi vody, mechennoy tritiyem)

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 4, pp 943-947 (USSR)

ABSTRACT: The method for the determination of moisture permeability of synthetic materials by the aid of tritium-marked water (Refs 1-3) allows a considerably greater accuracy and a shorter duration of experiments. In order to simplify the hitherto complicated measurements the use of a flow counter SBS-6 (instead of a counter SBS-2) or SBM-8) is suggested. After several attempts with various substances it was found that ethanol vapor is the most advantageous filling gas. Diagrams are given concerning the operational tension range (Fig 1) and the counter characteristics are specified. A special vacuum apparatus was constructed to serve for the above mentioned determinations, under utilization of the counter SBS-6 (Fig 3). The apparatus consists essentially of three independent vacuum diffusion cells with

Card 1/2

The Application of a Flow Counter for the Measurement of the Moisture Permeability of Films From Synthetic Materials With the Aid of Water Marked With Tritium

individual reservoirs of radioactive water and a counter each. The radioactive water quantity passed through the synthetic material film goes through the counter along with the ethanol vapor and is measured at the radiometer of the type B. The diagram of a steam diffusion as a function of time through polyethylene films (0.3 mm and 0.1 mm thickness) is given (Fig 4). The measuring range of the counter can be controlled by a change in the quantity of the ethanol vapor flow. There are 4 figures and 8 references, 4 of which are Soviet.

ASSOCIATION: Institut kabel'noy promyshlennosti, Moskva, Akademiya nauk SSSR Institut fizicheskoy khimii, Moskva
(Institute of Cable Industry Moscow, Academy of Sciences, USSR, Institute of Physical Chemistry, Moscow)

SUBMITTED: December 1, 1958

5(4) 15(8)

AUTHORS: Chmutov, K. V., Finkel', E. E.

SOV/76-33-7-30/40

TITLE: The Effect of γ-Radiation of Co^{60} on the Permeability of Polyethylene for Steam

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 7, pp 1648 - 1652 (USSR)

ABSTRACT: Plastics have recently found wide application for line insulation and are e.g. in reactor construction, exposed to radiations which are capable of changing insulation properties. Radiation-chemical treatment is also carried out for improving the resistivity of polyethylene insulations to heat (Ref 1). For this reason, it should be determined whether an improvement of the mechanical properties would not deteriorate other properties. The authors investigated pure polyethylene (I) with a molecular weight of 20000 - 25000 (trade-mark OKhK-501, VTU MKhP 4138-55) in the form of thin films (0.030-0.035 cm thick). The films were checked by means of the apparatus "K-2000" of the fiziko-khimicheskiy institut im. L. Ya. Karpova (Physicochemical Institute imeni L. Ya. Karpov), which delivers Co^{60} γ-rays with an activity of about 20000 s-equivalent to Ra (Ref 2) at doses of 49-299 million r. Experimen

tal results (Tables 1,2) indicate the following: The diffusion coefficient (DC) slightly drops with an increase in the radiation dose, and the permeability coefficient and solubility (S) rise considerably. The former is explained by a transition of (I) from the crystalline to the amorphous phase as well as by a concentration of (I) due to a lattice-like polymerization during the formation of transverse compounds. The increase in the (S) of steam in (I) is ascribed to the formation of polar groups under the influence of γ-radiations, which furthermore results in rising permeability of steam. The vigorous increase in the polarity of (I) after irradiation is confirmed by the rise of the quantity tg δ. Irradiation of (I)-insulations for improving their resistivity to heat should be carried out in vacuum or inert atmosphere. A method devised earlier for determining the water permeability of polymeric films by means of tritium-marked water is very sensitive to structural changes of the polymer occurring in radiolysis. This method may be employed for corresponding tests. In conclusion, the authors thank V. L. Karpov, Yu. M. Malinskiy, and A. S. Fridman for their assistance. There are 1 figure, 2 tables, and 10 refer-

The Effect of γ-Radiation of Co^{60} on the Permeability of Polyethylene for Steam SOV/76-33-7-30/4

ences, 7 of which are Soviet.

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii (Academy of Sciences of the USSR, Institute of Physical Chemistry); Nauchn issledovatel'skiy institut kabel'noy promyshlennosti (Scientific Research Institute for Cable Industry)

SUBMITTED: August 6, 1958

Card 3/3

GORBUNOVA, Kseniya Mikhaylovna; NIKIFOROVA, Anna Aleksandrovna; CHMUTOV, K.V., retsenzent; VAGRAMYAN, A.T., retsenzent; YEGOROV, N.G., red. izd-va; SHIKIN, S.T., tekhn.red.

[Physicochemical basis of the chemical nickel plating process] Fiziko-khimicheskie osnovy protsessa khimicheskogo nikelirovaniia. Moskva, Izd-vo Akad.nauk SSSR, 1960. 206 p. (MIRA 13:3)
(Nickel plating) (Hypophosphites)

LUK'YANOVICH, Vsevolod Mikhaylovich; CHMUTOV, K.V., otv.red.; BABAD-ZAKHRYAPIN, A.A., red.izd-va; POLYAKOVA, T.V., tekhn.red.; PRUSAKOVA, T.I., tekhn.red.

[Electron microscopy in physical and chemical investigations; methods and applications] Elektronnaia mikroskopiia v fiziko-khimicheskikh issledovaniiakh; metodika i primenenie. Moskva, Izd-vo Akad.nauk, 1960. 271 p. (MIRA 13:9)

1. Chlen-korrespondent AN SSSR (for Chmutov).
(Electron microscopy)

CHMUTOV, K.V., otv.red.; SHEMYAKIN, F.M., red.; GAPON, T.B., red.; YELOVICH, S.Yu., red.; SALDADZE, K.M., red.; TIMOFEYEV, D.P., red.; LEVI, T.G., red.izd-va; MAKUNI, Ye.V., tekhn.red.

[Chromatography, its theory and uses; proceedings of the All-Union Conference on Chromatography] Khromatografiia, ee teoriia i primenenie; trudy Vsesoiuznogo Soveshchaniia po khromatografii. Moskva, 1960. 462 p. (MIRA 13:7)

1. Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk.
(Chromatographic analysis)

СНМЮТОV, K.V.

LATYSHEV, G. D.

176

PHASE I BOOK EXPLOITATION SOV/5410

Tashkentskaya konferentsiya po mirnomu ispol'zovaniyu atomnoy energii. Tashkent, 1959.

Trudy (Transactions of the Tashkent Conference on the Peaceful Uses of Atomic Energy) v. 2. Tashkent, Izd-vo AN UzSSR, 1960. 449 p. Errata slip inserted. 1,500 copies printed.

Sponsoring Agency: Akademiya nauk Uzbekskoy SSR.

Responsible Ed.: S. V. Starodubtsev, Academician, Academy of Sciences Uzbek SSR. Editorial Board: A. A. Abdullayev, Candidate of Physics and Mathematics; D. M. Abdurasulov, Doctor of Medical Sciences; U. A. Arifov, Academician, Academy of Sciences Uzbek SSR; A. A. Borodulina, Candidate of Biological Sciences; V. N. Ivashev; G. S. Ikramova; A. Ye. Kiv; Ye. M. Lobanov, Candidate of Physics and Mathematics; A. I. Nikolayev, Candidate of Medical Sciences; D. Nishanov, Candidate of Chemical Sciences; A. S. Sadykov, Corresponding Member, Academy of Sciences USSR, Academician, Academy of Sciences Uzbek SSR; Yu. N. Talanin,

Card 1/20

Transactions of the Tashkent (Cont.) SOV/5410

Candidate of Physics and Mathematics; Ya. Kh. Turakulov, Doctor of Biological Sciences. Ed.: R. I. Khamidov; Tech. Ed.: A. G. Babakhanova.

PURPOSE : The publication is intended for scientific workers and specialists employed in enterprises where radioactive isotopes and nuclear radiation are used for research in chemical, geological, and technological fields.

COVERAGE: This collection of 133 articles represents the second volume of the Transactions of the Tashkent Conference on the Peaceful Uses of Atomic Energy. The individual articles deal with a wide range of problems in the field of nuclear radiation, including: production and chemical analysis of radioactive isotopes; investigation of the kinetics of chemical reactions by means of isotopes; application of spectral analysis for the manufacturing of radioactive preparations; radioactive methods for determining the content of elements in the rocks; and an analysis of methods for obtaining pure substances. Certain

Card 2/20

Transactions of the Tashkent (Cont.) SOV/5410

instruments used, such as automatic regulators, flowmeters, level gauges, and high-sensitivity gamma-relays, are described. No personalities are mentioned. References follow individual articles.

TABLE OF CONTENTS:

Card 3/20

CHMUTOV, K. V., KASACHOTKIN, V. I., LUK'YANOVICH, V. M., POPOV, M. M.

"Research by microdiffraction on the structure of lampblack particles."

report to be submitted for the 10th Annual Meeting, French Society of Chemistry (Structure and Reaction Kinetics of Graphite) - Paris, France, 7-10 Jun 1960.

81553
S/062/60/000/05/02/008
B004/B066

5,2100

AUTHORS: Aleksandrova, L. S., Chmutov, K. V.

TITLE: Separation of Niobium and Tantalum by Means of the Chromatographic Adsorption-complex Method

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, No. 5, pp. 801-805

TEXT: In the introductory part of the paper the authors discuss the various methods of separating Ta and Nb described in publications, and refer in this connection to papers by Ya. A. Chernikhov and Vendel'shteyn (Ref. 4), V. S. Bykova (Refs. 5,6), and V. I. Chastukhina (Ref. 8). The authors used in this investigation the method suggested by T. B. Gapon and A. M. Gurvich (Ref. 15). As the carrier a substance is applied which contains the separating agent already in the adsorbed state. A ДАУХ (DAUKh) charcoal served as carrier on which phenyl arsonic acid, tannin or o-hydroxyquinoline were adsorbed as precipitant. The adsorptive capacity of the charcoal for these reagents was determined in

Card 1/3

Separation of Niobium and Tantalum by Means of the Chromatographic Adsorption-complex Method

preliminary experiments. The further experiments were performed with phenyl arsonic acid which forms with Nb and Ta the complex compound $[R_2O_4(C_6H_5AsO_3)_2]H_2$. The niobium compound remains dissolved in the presence of mineral acids and oxalic acid. A HCl concentration of between 0.3 - 3 N does not exert any influence upon the reaction. Nb_2O_5 and Ta_2O_5 were molten in a platinum crucible with potassium pyrosulfate and dissolved in ammonium oxalate. The concentration of the initial and of the equilibrated solutions were measured by means of Nb^{95} and Ta^{182} (Table). It may be seen from Figs. 1-3 that Nb passes over to a practically quantitative extent into the filtrate. The Nb-tail was washed out by a mixture of ammonium oxalate and HCl. The filtrates were measured in an AC-1 (AS-1) counter. The tantalum was washed out by means of KOH or oxalic acid (Figs. 1,2). Oxalic acid was more effective but displaced only 60 per cent of tantalum. Under the experimental conditions (length of the chromatographic column 250 mm, diameter 12 mm) the quantity of $Nb_2O_5 + Ta_2O_5$ must not exceed 25 mg. There are 3 figures, 1 table, and 16 references: 8 Soviet, 3 British, 1 Dutch, 1 French, 1 German, and

Card 2/3

81553

Separation of Niobium and Tantalum by Means of the Chromatographic Adsorption-complex Method

S/062/60/000/05/02/008
B004/B066

2 American.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

SUBMITTED: November 17, 1958

Card 3/3

S/030/60/000/010/005/018
B021/B058

AUTHORS: Gapon, T.B., Gurvich, A. M., Chmutov, K. V.

TITLE: Adsorption-complex-forming Chromatographic Method

PERIODICAL: Vestnik Akademii nauk SSSR, 1960, No. 10, pp. 58-60

TEXT: A short definition of the principle of chromatography is given. The elaboration of sedimentary chromatography based on the differences of the solubility of sediments formed by the materials to be separated with the precipitator-reagent, constitutes a great progress. The replacement of the inert carrier of the column by an adsorbent such as active carbon opens good prospects. The separation of metals in columns is mainly based on the different capabilities of the cations to form complexes with the given reagents, and on the stability of the complexes being formed. Of all variants of chromatographic purification of the raw material for luminophors, the method of using adsorption-complex-forming columns is the most suitable one for industry, since it is simple, effective, safe and economic. Mixtures of materials with very similar properties can be separated by this

Card 1/2

Adsorption-complex-forming Chromatographic Method

S/030/60/000/010/005/018
B021/B058

method. The separation of Nb and Ta in columns with coal and tannin at 100°C is mentioned as an example. Finally, it is stated that the adsorption-complex-forming chromatographic method permits to establish columns with extraordinary selectivity through simple procedures and by means of usual chemical reagents and cheap, accessible adsorbents. Not only complex-forming reactions but also other chemical reactions can be used in a similar way. It is, however, necessary that the materials to be separated show a different reactivity toward the given reagents and that the compounds formed remain solidly bonded to the surface of the adsorbents. This principle can also be used for carrying out some organic reactions and the separation of their products. There is 1 Soviet reference.

Card 2/2

S/078/60/005/02/019/045
B004/B016

5(2)
AUTHORS: Maslova, G. B., Nazarov, P. P., Chmutov, K. V.

TITLE: Separation of Some Radioactive Rare Earths by Means of Chromatography

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol 5, Nr 2, pp 359-365 (USSR)

ABSTRACT: The authors report on the chromatographic separation of radioactive La, Ce, Pr, Nd, Pm, and Y on the ion exchanger KU-2 (experiments with SDV-3 resin were less successful). The isotopes La^{140}, Ce^{141} + Ce^{144} $\rightarrow$ Pr^{144}, Pr^{143}, Nd^{147}, and Y^{91} were formed by bombarding uranium with thermal neutrons in the pile. As complexing agents, lactic acid (Figs 1,2), and pyrophosphoric acid (Fig 3) were used. The experiments with lactic acid are described in the experimental part (Table 1, Figs 4,5). The stability constants of the lactate complexes of Ce, Nd, and Y were determined by potentiometric titration and ion exchange (Tables 2,3). The authors cite V. I. Paramonova (Ref 5). There are 5 figures, 3 tables, and 15 ref-

Card 1/2

Separation of Some Radioactive Rare Earths by Means of Chromatography

S/078/60/005/02/019/045
B004/3016

erences, 5 of which are Soviet.

SUBMITTED: September 16, 1958

Card 2/2

CHMUTOV, K.V.; LUK'YANOVICH, V.M., kand.khimicheskikh nauk

Structure of graphite and the kinetics of its reactions. Vest AN SSSR 30 no.9:73-74 S '60. (MIRA 13:9)

1. Chlen-korrespondent AN SSSR (for Chmutov).
(Graphite)

AVGUL', V.T.; BATRUKOV, V.S.; CHMUTOV, K.V. (Moskva)

New model of a chromatographic collector. Zhur. fiz. khim. 34 no.2:460-461 F '60. (MIRA 14:7)
(Chromatographic analysis) (Chemical apparatus)

CHMUTOV, Konstantin Vasil'yevich; AVGUL', Vladimir Tomashevich; VLASOV, L.G., red. izd-va; ROMANOV, G.N., tekhn. red.

[Automatic instruments in chromatographic column analysis] Avtomaticheskie pribory v kolonochnom khromatograficheskom analize. Moskva, Izd-vo Akad.nauk SSSR, 1961. 52 p. (MIRA 14:6)
(Chromatographic analysis)

ARBUZOV, A.Ye., akad.; VAVILOV, S.I., akad.; VOL'FKOVICH, S.I., akad.; KOCHINA, P.Ya., aked.; LANDSBERG, G.S., akad.; LEYBENZON, L.S., akad.; PORAY-KOSHITS, A.Ye., akad.; SMIRNOV, V.I., akad.; FESENKOV, V.G., akad.; CHERNYAYEV, V.I., akad.; KAPUSTINSKIY, A.F.; KORSHAK, V.V.; KRAVKOV, S.V.; NIKIFOROV, P.M.; PETROV, A.D.; PREDVODITELEV, A.S.; FRISH, S.E.; CHETAYEV, N.G.; CHMUTOV, V.K.; SHOSTAKOVSKIY, M.F.; KUZNETSOV, I.V., red.; MIKULINSKIY, S.R., red.; MURASHOVA, N.Ya., tekhn.red.

[Men of Russian science; essays on prominent persons in natural science and technology: Mathematics, mechanics, astronomy, physics, chemistry] Liudi russkoi nauki; ocherki o vydaiushchikhsia deiateliakh estestvoznaniia i tekhniki: matematika, mekhanika, astronomiia, fizika, khimiia. Moskva, Gos. izd-vo fiziko-matem. lit-ry, 1961. 599 p. (MIRA 14:10)

1. Chleny-korrespondenty AN SSSR (for Kapustinskiy, Korshak, Kravkov, Nikiforov, Petrov, Predvoditelev, Frish, Chetayev, Chmutov, Shostakovskiy) (Scientists)

ALEKSEYEV, N.G.; PROKHOROV, V.A.; CHMUTOV, K.V.; FINKEL', E.E., red.; KOGAN, V.V., tekhn. red.

[Use of electronic equipment and circuits in physical chemistry] Primenenie elektronnykh priborov i skhem v fiziko-khimicheskom issledovanii. Moskva, Gos. nauchno-tekhn. izd-vo khim. lit-ry, 1961. 552 p. (MIRA 14:12)

(Electronic apparatus and appliances)
(Chemistry, Physical and theoretical)

S/081/61/000/024/016/086
B138/B102

AUTHORS: Kiseleva, Ye. D., Chmutov, K. V., Krupnova, V. N.

TITLE: Effect of the ionizing radiation of an excelerated-electron current on the cation-exchange resin КУ-2 (KU-2)

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 24, 1961, 99, abstract 24B727 (Tr. Tashkentsk. konferentsii po mirn. ispol'zovaniyu atomn. energii, v. I, 1959. Tashkent, AN UzSSR, 1961, 313 - 319)

TEXT: It has been found that, if the cation-exchange resin KU-2 is exposed to an accelerated electron current with irradiation doses of 10^{21} - 10^{23} ev/g, in various media, in all cases there is a reduction in the exchange capacity with respect to the SO_3H group. At a certain irradiation dose new exchange groups of the carboxyl (pH 4.4) and phenol (pH 7.3) types appear. If KU-2 is irradiated in different systems (KU-2 + air; KU-2 + water; KU-2 + 0.5 N HNO_3) the swelling varies in different ways.

Card 1/2

Effect of the ionizing radiation of ... S/081/61/000/024/016/086
B138/B102

Investigation of the exchange statistics of the ion Cs^+ for H^- show that K_H^{Cs} and the time required for the establishment of equilibrium are not constants for specimens irradiated in different media and by different doses. [Abstracter's note: Complete translation.]

Card 2/2

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14.8060

S/081/62/000/006/098/117
B162/B101

AUTHORS: Parfenova, D. S., Sokolova, Z. F., Finkel', E. E., Chmutov, K. V.

TITLE: Study of the effect of ionizing radiation on the moisture penetrability of polyethylene

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 6, 1962, 614, abstract 6P31, (Tr. Tashkentsk. konferentsii po mirn. ispol'zovaniyu atomn. energii, v. II, 1959, Tashkent, UzSSR, 1961, 389-395)

TEXT: An investigation is made of the moisture penetrability of polyethylene irradiated with Co^{60} gamma-rays in a dose range of 46 to 299 Mrad. It is established that the diffusion coefficient after irradiation in air drops slightly, while the coefficients of penetrability and solubility increase. The drop in the diffusion coefficient is associated with the increase in density of polyethylene through cross-linking as a result of irradiation. The rise in polarity, i.e., the development of carbonyl, carboxyl, and hydroxyl groups in the polymer, and its conversion from a hydrophobic material into a hydrophilic one. The increase in the coefficient of

Card 1/2

Study of the effect of ionizing ...

S/081/62/000/006/098/117
B162/B101

moisture penetrability is connected with the rise in solubility. The substantial increase in polarity of polyethylene irradiated in air is confirmed by measurements of the dielectric properties. [Abstracter's note: Complete translation.]

Card 2/2

AVGUL', V.T.; YELOVICH, S.Yu. [deceased]; SEMENOVSKAYA, T.D.; CHMUTOV, K.V. (Moskva)

Chromatographic column for the operation at high temperatures. Zhur. fiz. khim. 35 no. 4:946-947 Ap '61. (MIRA 14:5)

1. Akademiya nauk SSSR, Institut fizicheskoy khimii.
(Chromatographic analysis)

BREZHNEVA, N.Ye.; MARGOLIS, L.Ya.; TODES, O.M.; DOBYCHIN, D.P.; CHMUTOV, K.V.

Solomon IUl'evich Elovich. Zhur. fiz. khim. 35 no.5:1172-1173 My '61. (MIRA 16:7)

(Elovich, Solomon IUl'evich, 1898-1961)

KISELEVA, Ye.D.; CHMUTOV, K.V.; KRUPNOVA, V.N.

Effect of the ionizing radiation of an accelerated electron current on the cation exchanger KU-2. Zhur.fiz.khim. 35 no.8:1816-1821 Ag '61. (MIRA 14:8)

1. Institut fizicheskoy khimii AN SSSR.
(Ion exchange resins)
(Radiation)

KISELEVA, Ye.D. (Moskva); CHMUTOV, K.V. (Moskva); KRUPNOVA, V.N. (Moskva)

Effect of the ionized radiation of an accelerated electron current on the cation exchange resin KU-2 Part 2: Irradiation of KU-2 in aqueous solutions of acids and in a bidistillate. Zhur.fiz.khim. 35 no.8:1822-1827 Ag '61. (MIRA 14:8)

1. Institut fizicheskoy khimii AN SSSR.
(Ion exchange resins)
(Radiation)

CHMUTOV, K.V.

Ukrainian Interuniversity Conference in Odessa (May 24-29) on Adsorption and Methods of Chromatographic Analysis. Zhur.fiz. khim. 35 no.9:2170-2172 '61. (MIRA 14:10)
(Adsorption--Congresses)
(Chromatographic analysis--Congresses)

CHMUTOV, Konstantin Vasil'yevich; TARASENKO, V.M., red. izd-va; YEGOROVA, N.F., tekhn. red.

[Chromatography]Khromatografiia. Moskva, Izd-vo Akad. nauk SSSR, 1962. 98 p. (MIRA 16:2)

1. Chlen-korrespondent Akademii nauk SSSR (for Chmutov).
(Chromatographic analysis)

CHMUTOV, K. V.

128

PHASE I BOOK EXPLOITATION SOV/6246

Soveshchaniye po tseolitam. 1st, Leningrad, 1961.

Sinteticheskiye tseolity; polucheniye, issledovaniye i primeneniye (Synthetic Zeolites: Production, Investigation, and Use). Moscow, Izd-vo AN SSSR, 1962. 286 p. (Series: Its: Doklady) Errata slip inserted. 2500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk. Komisiya po tseolitam.

Resp. Eds.: M. M. Dubinin, Academician and V. V. Serpinskiy, Doctor of Chemical-Sciences; Ed.: Ye. G. Zhukovskaya; Tech. Ed.: S. P. Golub'.

PURPOSE: This book is intended for scientists and engineers engaged in the production of synthetic zeolites (molecular sieves), and for chemists in general.

Card 1/3

Synthetic Zeolites: (Cont.) SOV/6246

COVERAGE: The book is a collection of reports presented at the First Conference on Zeolites, held in Leningrad 16 through 19 March 1961 at the Leningrad Technological Institute imeni Lensovet, and is purportedly the first monograph on this subject. The reports are grouped into 3 subject areas: 1) theoretical problems of adsorption on various types of zeolites and methods for their investigation, 2) the production of zeolites, and 3) application of zeolites. No personalities are mentioned. References follow individual articles.

TABLE OF CONTENTS:

Card 2/3

Synthetic Zeolites: (Cont.) SOV/6246

Card [redacted] 3/3

S/844/62/000/000/102/129
D204/D307

AUTHORS: Kiseleva, Ye. D., Chmutov, K. V., Krupnova, V. N. and Filatova, N. V.

TITLE: The effect of the exchanging ion and of linking on the radiation stability of ion-exchange resins

SOURCE: Trudy II Vsesoyuznogo soveshchaniya po radiatsionnoy khimii. Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1962, 603-610

TEXT: The present work is part of a systematic search for radiation-stable ion-exchange resins. The effect of cross-linking was studied on cationites СБС-2 (SBS-2, a copolymer of styrene and butadiene) and on КУ-2 (KU-2, copolymer of styrene and divinylbenzene). The irradiation was carried out in water, by a method described earlier (ZhFKh, 25, 1816 (1961)) using the linear accelerator of the authors' Institute, the dose being (0.2 - 2.1) x 10^{23} ev/g.

The exchange capacity of KU-2 in the H^+ form decreased on irradiation and was generally higher for higher contents (2 - 16%, great-

Card 1/3

est at 12%) of divinylbenzene (DVB); new exchanging groups, with a pK of 7.5 appeared in amounts increasing with the dose, independently of the DVB content which denotes the degree of linking. The percentage swelling on irradiation depended on the content of DVB and was lowered by doses exceeding ~0.7 x 10^{23} ev/g. The selectivity w.r.t. the Cs^+ ion, characterized by exchange constant k_H^{Cs}, was generally lower for lower constants of DVB and varied irregularly with the dose, remaining little changed on the average. The pH rose from ~2 for unirradiated to ~12 for irradiated KU-2 (0.7 - 1.1 x 10^{23} ev/g, 12 - 16% DVB). Cu^{2+}, Cr^{3+}, Fe^{3+} and UO_2^{2+} forms of KU-2 lost their exchange capacity more slowly than the H^+ form, but the degree of swelling rose from 90 to 180% for a dose of 1.4 x 10^{23} ev/g. The radiation stability of KU-1 (a sulfonated phenolic type) treated in a similar manner, was higher than that of KU-2; the properties remained essentially unchanged. SBS-2 largely retained its exchange capacity for doses up to 2.16 x 10^{23} ev/g, but the percentage swelling went through a minimum of ~20% at ~0.5 x 10^{23} ev/g.

S/844/62/000/000/102/129
D204/D307

The properties of an anionite AB-17 (AV-17) remained essentially unchanged when the resin was irradiated, in various ionic forms. The changes in the properties of KU-2 are ascribed to changes in the structure of the resin, resulting from the fission of C-S and C-C bonds, followed possibly by interaction with the radiolysis products of water. There are 11 figures and 2 tables.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry, AS USSR)

S/076/62/036/004/007/012
B101/B110

21.4200

AUTHORS: Chuveleva, E. A., Nazarov, P. P., and Chmutov, K. V. (Moscow)

TITLE: Investigation of the ion exchange sorption of radio elements by soils. I. Sorption of radiocerium by black earth

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 4, 1962, 825-829

TEXT: The sorption of microamounts of Ce was studied on black earth from the Poltavskaya oblast', containing 4% humus. $Ce^{144} \rightarrow Pr^{144}$ and Ca^{45} were used as radioactive indicators. The Na - Ce and Ca - Ce exchange equilibria were investigated, using the linear equations $q_{Ce} = S - (1/k_1)C_{Na}(q_{Ce}/C_{Ce})^{1/3}$ and $q_{Ce} = S - (1/k_2^2)C_{Ca}(q_{Ce}/C_{Ce})^{2/3}$. The value of the concentration constant was found from the tangent of inclination of the straight line, and the capacity of exchange, from the section on the q_{Ce} axis. Back earth was converted into the Na^+ form by means of 0.5 N $NaNO_3$, and into the Ca^{2+} form by means of 0.11 N $CaCl_2$, and then treated with $NaNO_3$ or $CaCl_2$ solutions containing $5 \cdot 10^{-3}$ to $6 \cdot 10^{-2}$ N Ce.

Card 1/2

Sorption takes place by ion exchange. The exchange constant k^{Ce}_{Na} was found to be 24.5, k^{Ce}_{Ca} = 2.46. However, these values depend on the occupancy: up to 1% occupation, k^{Ce}_{Ca} was 12 (maximum value) and only dropped to 2.46 at 30-90% occupation. Ce distribution between black earth and 4 N $NaNO_3$ (I) or 2 N $Ca(NO_3)_2$ (II) produced the following results: For I, complete adsorption of Ce occurred with 10^{-9} to $2 \cdot 10^{-3}$ N Ce, quick decrease of the adsorption with $> 4 \cdot 10^{-3}$ N Ce (to 49.4% with $1.0 \cdot 10^{-2}$ N Ce). For II, almost complete adsorption was observed with $< 1 \cdot 10^{-4}$ N Ce (85.4-86.6%) and quick decrease at higher concentrations (only 40.0% with $4 \cdot 10^{-3}$ N Ce). Experiments with montmorillonite (M) and humic acid (HA) showed that M only adsorbs little Ce, while HA is the most active adsorbent ($\sim$100%). Ce adsorption dropped to 52.2% when treating HA with 30% H_2O_2. There are 3 figures and 5 tables.

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii (Academy of Sciences USSR, Institute of Physical Chemistry)

SUBMITTED: March 3, 1961

Card 2/2

37078
S/076/62/036/004/008/012
B101/B110

21.4700

AUTHORS: Chuveleva, E. A., Chmutov, K. V., and Nazarov, P. P. (Moscow)

TITLE: Investigation of the ion exchange sorption of radio elements by soils. II. Study of the ion exchange equilibrium Ce - Ca on humic acid

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 4, 1962, 830-832

TEXT: The Ca-Ce exchange under static conditions, at constant ionic strength, $\mu = 3$ was studied on humic acid produced from pine peat by collaborators of S. S. Dragunov at the Kalininskiy torfyanoy institut (Kalinin Peat Institute). 2 N $Ca(NO_3)_2$ solution which contained different amounts of Ce and Ce^{144} - Pr^{144}, was added to humic acid in Ca^{2+} form. An equilibrium constant $K_{Ca}^{Ce} = 7.3$ and a capacity of 3.6 mg·equiv/g of the exchange were found. The Ca^{2+} - Ce^{3+} exchange on the carboxylic cationite KB-4 (KB-4) (containing 2.5% divinyl benzene)

Card 1/3

X

and on the sulphonic acid cationite KY-2 (KU-2) was tested for comparison. K_{Ca}^{Ce} = 7.2 was found for KB-4, and K_{Ca}^{Ce} = 1.13 for KU-2. Result: The adsorption properties of humic acid are comparable with those of carboxylic resin KB-4. Humic acid and KB-4 may be used for the removal of radioactive elements from solutions containing large amounts of alkali and alkaline earth salts. pH = 3-5 is most suitable for humic acid, pH > 5 for KB-4. The effect of hydrogen ions on sorption of Ce^{3+} and Y^{3+} by humic acid was also tested. Result: (for pH = 1.13-1.64, μ = 0.1) K_{Ce}^{H} = 4.0, exchange capacity 0.718 mg·equiv/g. The value of K_{Ce}^{H} and K_{Y}^{H} increases, however, with rising pH:

pH	1.5	2.0	3.0	4.0	4.35	
K_{Ce}^{H}	4.0	15	100	500	750	and
pH	1.46	2.43	2.9	3.76	4.0	
K_{Y}^{H}	1.67	34.5	80.5	1050	1250.	

Card 2/3

There are 4 figures and 2 tables. The most important English-language reference reads as follows: H. Sobue, J. Tabata, J. Polym. Sci., 20, no. 96, 567, 1956.

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii (Academy of Sciences USSR, Institute of Physical Chemistry)

SUBMITTED: March 3, 1961

Card 3/3

37079
S/076/62/036/004/009/012
B101/B110

21.4200

AUTHORS: Chuveleva, E. A., Chmutov, K. V., and Nazarov, P. P. (Moscow)

TITLE: Investigation of the ion exchange sorption of radio elements by soils. III. Determining the dissociation constant of carboxylic groups of humic acid

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 4, 1962, 833-835

TEXT: In previous studies (Zh. fiz. khimii, 36, 830, 1962) it was found that humic acid and carboxylic resins may be used as sorbents for RE fission elements from solutions containing large amounts of alkali and earth alkaline salts. In the present study, the dissociation constants of humic acid and the carboxylic cationites КБ-4 (KB-4) and СГ-1 (SG-1) were measured by means of potentiometric titration in 1 N $CaCl_2$ solution under static conditions. Results: (1) For humic acid the titration curve points to two types of acid groups. The change of the adsorption capacity over a wide pH range is explained by the presence of weaker exchange groups at pH 5-6, whereas above pH = 7 phenyl groups seem to exist. (2) KB-4 and SG-1 only contain identical acid groups which completely

Card 1/2

dissociate at pH = 6.62 (for KB-4), and pH = 6.1 (for SG-1). (3) The apparent dissociation constants are $2.51 \cdot 10^{-4}$ for humic acid, $1.12 \cdot 10^{-5}$ for KB-4, and $2 \cdot 10^{-5}$ for SG-1. Humic acid may be used for ion sorption from solutions with pH 3-5, the two resins for sorption at pH > 5. The higher acidity of humic acid is explained by the presence of phenol groups, the dissociation constants of benzoic acid and hydroxy benzoic acid are mentioned as analog. There are 6 figures. The most important English-language reference reads as follows: S. Fisher, R. Kunin, J. Phys. Chem., 8, 1030, 1956.

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii (Academy of Sciences USSR, Institute of Physical Chemistry)

SUBMITTED: March 3, 1961

Card 2/2

37632
S/076/62/036/005/007/013
B101/B110

18.1791

AUTHORS: Chuveleva, E. A., Nazarov, P. P., and Chmutov, K. V.

TITLE: Application of partition chromatography to the separation of rare earth elements

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 5, 1962, 1022 - 1027

TEXT: Partition chromatographic separation of Ce, Y, Pm, and Eu was carried out using columns filled with KCK (KSK) silica gel or KY-2 (KU-2) cationite as carrier of the aqueous phase (10 N HNO_3). Elution was conducted with tributyl phosphate (TBP). $Ce^{144} \rightarrow Pr^{144}$; Y^{91}; Pm^{147}, and $Eu^{152,154}$ were used as tracers. The distribution coefficient C_d, the number N of theoretical plates (according to F. W. Cornish, see below), and the coefficient D_s (cm^2/sec) of internal diffusion (according to Glückauf, Ref. 10, see below), as well as the separation factor S were determined. Results: (1) Silica gel of 60 - 90 mesh grain size yielded for Ce: C_d = 10.1, N = 4; with 30 - 60 mesh: C_d = 9.2, N = 8,

Card 1/3

$D_s = 1 \cdot 10^{-7}$. Reduction of the grain size led to a reduction of N owing to agglutination of silica gel. Better results with silica gel were obtained when it contained only 30% aqueous phase (as referred to complete saturation): $C_d = 62.6$, $N = 32$, $D_s = 2.3 \cdot 10^{-9}$. The reduced D_s value is explained by penetration of TBP into the silica gel pores. (2) With KU-2, the separation of Ce from Y yielded: $C_{Ce} = 11.5$, $N_{Ce} = 20$, $D_{Ce} = 1.4 \cdot 10^{-8}$. The use of silica gel may be of advantage (higher D_s value) if agglutination can be avoided. (3) Separation of Pm from Ce on KU-2 yielded: $C_{Pm} = 8.2$; $N_{Pm} = 8$; $D_{Pm} = 1 \cdot 10^{-8}$; $C_{Ce} = 29.5$; $N_{Ce} = 26$; $D_{Ce} = 8.7 \cdot 10^{-9}$; $S = C_{Ce}/C_{Pm} = 3.26$; ratio N' of the plates = 3.26. (4) Separation of Eu from Pm yielded: $C_{Eu} = 28.1$; $N_{Eu} = 30$; $C_{Pm} = 48.6$; $N_{Pm} = 50$; $S = 1.73$; $N' = 1.67$. (5) Separation of Y, Eu, and Pm from Ce yielded: $C_Y = 14.2$; $N_Y = 188$; $D_Y = 2.2 \cdot 10^{-8}$; $C_{Eu} = 24.8$; $N_{Eu} = 324$; $D_{Eu} = 1.6 \cdot 10^{-8}$; $C_{Pm} = 48.5$;

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B101/B110

Application of partition...

$S_{Eu-Y} = 1.74$; $N'_{Eu-Y} = 1.72$. Conclusions: (A) The observed direct dependence of N on C_d indicates that the limiting stage of the process is diffusion into the sorbent-carrier particles. (B) The possibility of attaining high N values is an advantage of partition chromatography. (C) Higher D values were reached with ion exchange chromatography: $D_{Ce} = 2 \cdot 10^{-8}$; $D_{Pm} = 6 \cdot 10^{-8}$. It is assumed that higher D values can also be attained with partition chromatography by working at lower ion intensity, using less viscous and more polar extractants. There are 6 figures and 1 table. The most important English-language references are: F. W. Cornish, Analyst, 83, 634, 1958; Ref. 10: Ion Exchange and its applications, London, 1955; J. J. van Deemter, F. J. Zulderweg, A. Klinkenberg, Chem. Eng. Sci., 5, 271, 1956.

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii (Academy of Sciences USSR, Institute of Physical Chemistry)

SUBMITTED: August 9, 1960

Card 3/3

S/076/62/036/006/009/011
B101/B144

AUTHORS: Chuveleva, E. A., Nazarov, P. P., and Chmutov, K. V.

TITLE: Study of the sorption of radioelements by soils owing to ion exchange. IV. Complexing of some metal ions with humic acid

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 6, 1962, 1378-1381

TEXT: A KY-2 (KU-2) cationite in Na^+ form with pH = 6 was used for studying the complex formation of Y^{90}, Pm^{147}, and Ca^{45} with humic acid ($2 \cdot 10^{-6}$ - $5 \cdot 10^{-5}$ N humic acid in RE elements, $2 \cdot 10^{-4}$ - $5 \cdot 10^{-3}$ N in Ca). The function $1/\lambda = f(A)$ was plotted (λ = distribution factor, A = concentration of the anion) according to J. Schubert (J. Amer. Chem. Soc., 76, 3442, 1954), and the stability constant K was calculated. Results: (1) With Ca, only one complex forms having the ratio [M] : [A] = 1 : 1, $K = 1.2 \cdot 10^3$. (2) With Y and Pm, a mixture of two complexes with

Card 1/2

Study of the sorption...

the ratios 1 : 1 and 1 : 2 is found, where $K_1 = 1.45 \cdot 10^5$, $K_2 = 9.5 \cdot 10^{10}$ for Y, and where $K_1 = 1.25 \cdot 10^5$, $K_2 = 3.5 \cdot 10^{10}$ for Pm. The ability of humic acid to form complexes is similar to that of citric acid. There are 6 figures.

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii
(Academy of Sciences USSR, Institute of Physical Chemistry)

SUBMITTED: November 25, 1961

Card 2/2

CHMUTOV, K.V. (Moscow)

Simple apparatus for obtaining histograms. Zhur.fiz.khim. 36 no.10:2298-2299 O '62. (MIRA 17:4)

1. Institut fizicheskoy khimii AN SSSR.

KISELEVA, Ye.D.; CHMUTOV, K.V.; FILATOVA, N.V.

Radiation stability of ion-exchange resins. Part 3.
Zhur. fiz. khim. 36 no.11:2465-2468 N'62. (MIRA 17:5)

1. Institut fizicheskoy khimii AN SSSR.

43472

S/076/62/036/012/006/014
B101/B180

AUTHORS: Kiseleva, Ye. D., Chmutov, K. V., and Krupnova, V. N. (Moscow)

TITLE: Effect of the exchange ion and degree of DVB cross-linking on the radiation stability of ion exchange resins

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 12, 1962, 2707 - 2713

TEXT: In previous work (Zh. fiz. khimii, 1962) it was found that the SO_3H groups in the KY-2 (KU-2) ionite, a copolymer consisting of styrene and divinyl benzene(DVB), is detached by irradiation with fast electrons. The present work, deals with the possibility of eliminating the break in the C-S bonds. The stability of the ionite irradiated with $0.8 - 0.9 \cdot 10^{19}$ ev/g·sec was studied as dependent on the degree of DVB cross-linking (2-16% DVB) and type of exchange ion. The effect of the KU-2 exchange form, the charge of the exchange ions, especially cations with different valencies such as Fe^{3+}, Cr^{3+}, UO_2^{2+}, Cu^{2+}, Ni^{2+}, Co^{2+}, and the variation in the swelling and selectivity of KU-2 for Cs^+ ions were investigated. For comparison, the same studies were made on KY-1(KU-1), a phenol formaldehyde

Card 1/3

S/076/62/036/012/006/014
B101/B180

Effect of the exchange ion ...

resin. Results: Irradiation of KU-2 in the presence of Fe^{3+}, Cu^{2+}, Cr^{3+}, and UO_2^{2+} ions, stabilized the C-S bond but increased C-C bond breaking in the cross-links, which could be seen by increased swelling. Protection of the SO_3H group is attributed to the fact that ions with different valencies absorb the radiant energy. The valency change is indicated by a change in the color of the exchanger. In KU-1, however, the Fe^{3+}, Cu^{2+}, Cr^{3+}, and UO_2^{2+} form behaved exactly like the H^+ form. No protective effect was observed. Both resins, independent of their exchange form formed new exchange groups when irradiated, phenol groups in KU-2 (pK = 7.5) and carboxyl groups in KU-1 (pK = 6.6). When KU-2 with 2, 4, or 8% DVB cross-linking was irradiated with $0.18 \cdot 10^{23}$ - $0.76 \cdot 10^{23}$ ev/g, swelling increased and the selectivity coefficient $K_{H^+}^{Cs^+}$ decreased. At $1.1 \cdot 10^{23}$ ev/g, $K_{H^+}^{Cs^+}$ increased again. Above 12% DVB KU-2 showed only a slight increase in swelling when irradiated, whereas $K_{H^+}^{Cs^+}$ decreased irreversibly. Increased DVB cross-linking in KU-2 also caused some stabilization of C-S bonds. There are

Card 2/3

S/076/62/036/012/006/014
B101/B180

Effect of the exchange ion ...

7 figures and 3 tables.

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii (Academy of Sciences USSR, Institute of Physical Chemistry)

SUBMITTED: July 1, 1961

Card 3/3

OL'SHANOVA, Kaleriya Maksimovna; KOPYLOVA, Valentina Dmitriyevna; MOROZOVA, Nadeshda Mikhaylovna; CHMUTOV, K.V., otv. red.; VLASOV, L.G., red.; MAKOGONOVA, I.A., tekhn. red.

[Precipitation chromatography]Osadochnaia khromatografiia. Moskva, Izd-vo Akad.nauk SSSR, 1963. 103 p. (MIRA 16:2)

1. Chlen-korrespondent Akademii nauk SSSR (for Chmutov).
(Chromatographic analysis)

CHMUTOV, K.V.; DANCHEVSKAYA, M.; PANASYUK, G.

Along the labyrinths of pores and capillaries. Tekh. mol. 31 no.3:5-6 '63. (MIRA 16:6)

1. Chlen-korrespondent AN SSSR (for Chmutov).
(Chromatographic analysis)

FRUMKIN, A.N.; GERASIMOV, Ya.I.; CHMUTOV, K.V.; TEMKIN, M.I.; ZHUKHOVITSKIY, A.A.; TURKEL'TAUB, N.M.

Kirill Alekseevich Gol'bert. Zhur.fiz.khim. 37 no.1:249 Ja '63. (MIRA 17:3)

SEMENOVSKAYA, T.D.; AVGUL', V.T.; CHMUTOV, K.V.

Liquid chromatography at high temperatures. Zhur. fiz. khim. 37 no.5:1160-1162 My '63. (MIRA 17:1)

1. Institut fizicheskoy khimii AN SSSR.

L 17721-63 EWT(m)/BDS AFFTC/ASD RM

ACCESSION NR: AP3004074 S/0076/63/037/007/1626/1629

AUTHORS: Kiseleva, Ye. D.; Chmutov, K. V.; Krupnova, V. N. 58 57

TITLE: Analysis of radiation resistivity of polymerization anion-exchanging resins

SOURCE: Zhurnal fizicheskoy khimii, v. 37, no. 7, 1963, 1626-1629

TOPIC TAGS: anion-exchanging resins, radiation resistivity, styrole, AB-17 resin, AB-27 resin

ABSTRACT: A systematic analysis of the effect of radiation on anion-exchange resins, based on the dependence of their structure, chemical nature of ion exchange groups, binding strength, and the conditions of irradiation, has been accomplished. The results are presented for the ionizing irradiation of high speed electrons upon the ion-exchange resins of copolymeric styrole with divinylbenzene having various ion exchange groups (AB-17, AB-27 and AB-18). The polymeric anion exchange resins of the type AB-17 and AB-27 decrease their ion exchange capacity and change their swelling ability when irradiated with ionized irradiation of high speed electrons with a dose of 0.05 to $0.7 \cdot 10^{23}$ ev/g. When irradiating AB-17 and AB-27, a part of the ion exchange groups is converted into

Card 1/2

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ACCESSION NR: AP3004074

water or acid solutions. Dimethylamine and methylamine was found after irradiation of AB-17, by employing the paper chromatographic method. The anionite AB-18 is not affected by the irradiation. The irradiation of AB-18 was carried out in water using a dose of 2.10^{23} ev/g. Orig. art. has: 2 tables and 7 figures.

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii (Academy of sciences SSSR, Institute of physical chemistry)

SUBMITTED: 25Sep62 DATE ACQ: 10Sep63 ENCL: 00

SUB CODE: PH, GH NO REF SOV: 007 OTHER: 005

Card 2/2

MATORINA, N.N.; CHMUTOV, K.V.; SAFONOVA, N.D.; SHEPETYUK, L.V.

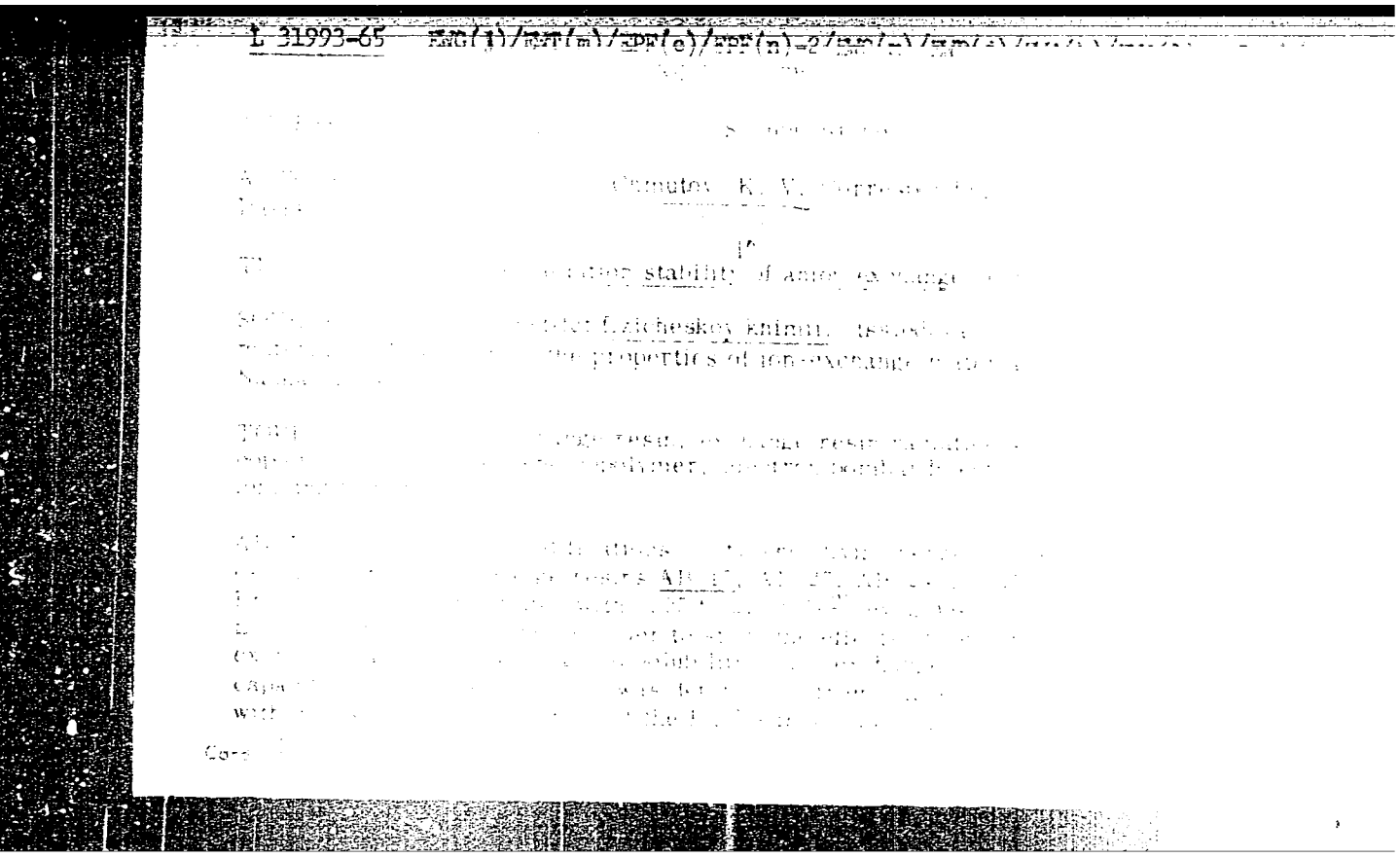
Kinetics of ion exchange processes in the presence of complex-forming reagents. Dokl. AN SSSR 152 no.4:915-918 O '63.
(MIRA 16:11)

1. Institut fizicheskoy khimii AN SSSR. 2. Chlen-korrespondent AN SSSR (for Chmutov).

CHMUTOV, K.V., [illegible], K.I., red.

[Molecular chromatography] Molekuliarnaia khromatografiia. Moskva, Nauka, 1964. 161 p. (MIRA 17:11)

1. Chlen-korrespondent AN SSSR (for Chmutov).



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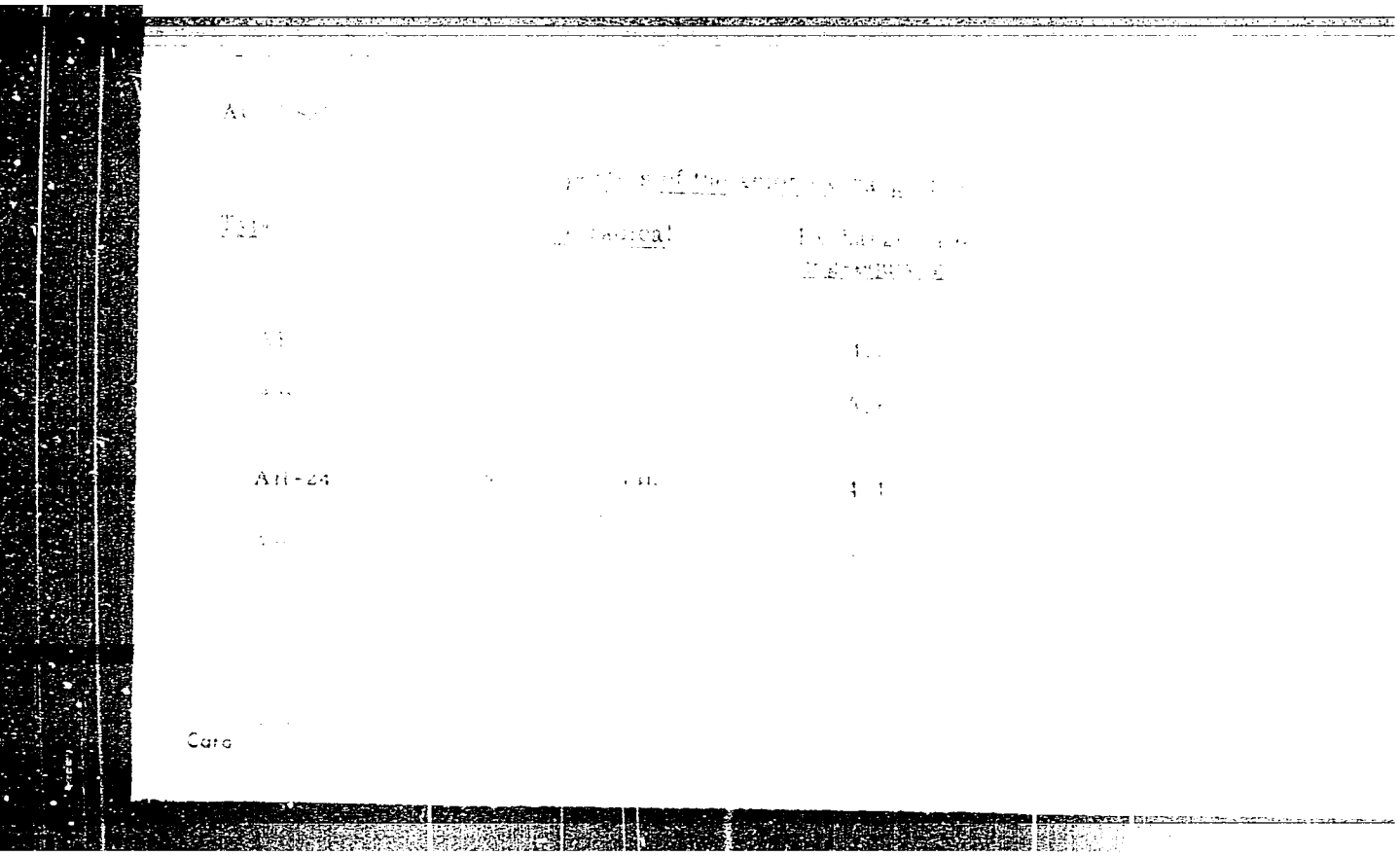
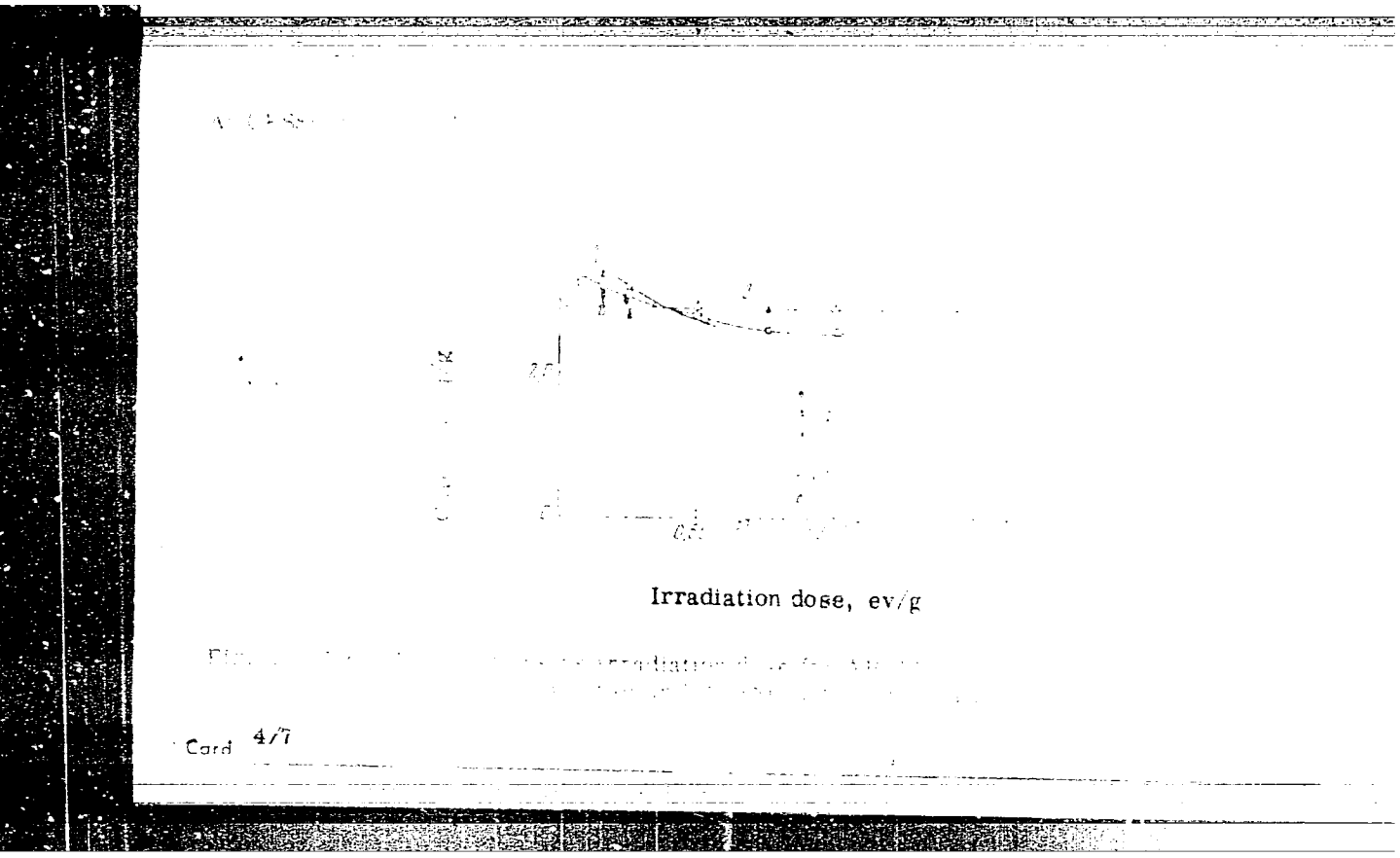
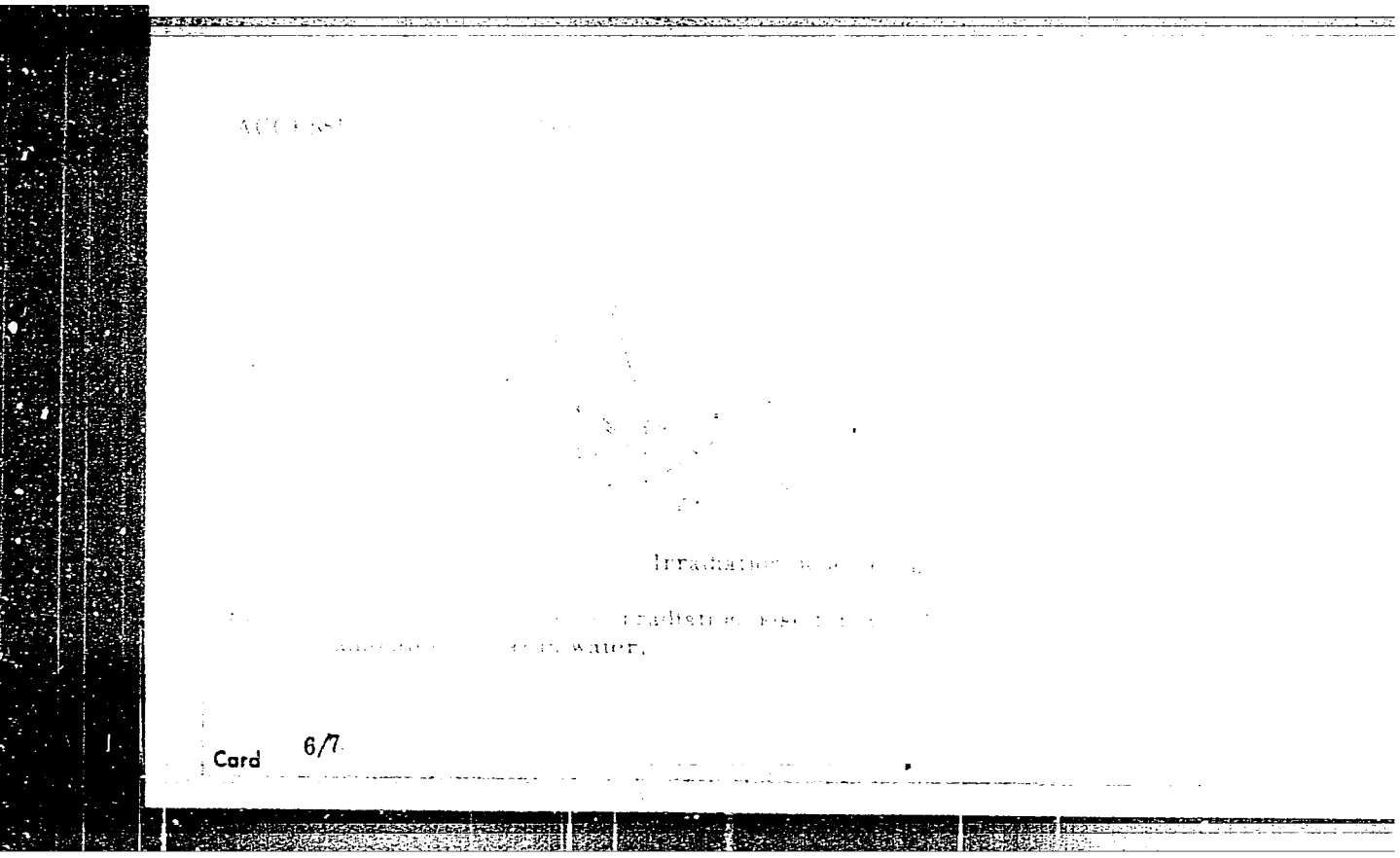




Irradiation dose, ev/g

Card 4/7

ACCESSION NR: AT5002305 ENCL: 03



Card 6/7